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INFORMATION SYSTEMS STUDENTS' PERCEPTIONS ON LEADING TEAMS TO HIGH PERFORMANCE: A PILOT STUDY

Research in Progress

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Abstract

Information Systems (IS) projects are creative processes implemented by teams. To succeed, such projects require teams to perform at their best. One of the ways to tackle this challenge is to enhance the human resources potential through effective team leadership. Notwithstanding high-performing teams have been studied for some years, little has been written about leading teams to high performance in the case of information systems projects. Building upon Thamhain's (2004) recommendations for leading teams effectively, the primary aim of this pilot study was to investigate how these recommendations are perceived and put to practice by IS students in their projects. Twenty eight teams of master's students involved in the development of IS projects were invited and participated in the study. The preliminary results show that, in overall, students perceive all recommendations as important or very important for team performance. Surprisingly (or not), these recommendations are also being put to practice in their projects, what can be a very good indicator of their future professional performance working in teams.

Keywords: Information Systems, Projects, Teams, High Performance, Team Leadership.

1 Introduction

Information Systems (IS) projects are characterized by emergency, uncertainty, and complexity, as they are frequently initiated and implemented in response to organizational strategic initiatives. Teams are meant for projects with these characteristics (Leonard and van Zyl, 2014; Stagnaro and Piotrowski, 2014; Collins and Schragle-Law, 2010; Thamhain, 2004).

Quite often IS project teams are organized hierarchically and technical professionals are called upon to lead peers because of their superior technical competence. As a result, research (e.g., Collins and Schragle-Law, 2010; Thamhain, 2004) shows that many technology-based projects fail apparently because of management, behavioral, and socio-organizational issues (i.e., the human side of project management), rather than technical difficulties. Moreover, authors (e.g., Leonard and van Zyl, 2014; Stagnaro and Piotrowski, 2014; Collins and Schragle-Law, 2010; Thamhain, 2004) suggest that team leadership (e.g., the ability of project managers to coordinate their teams and leadership styles) plays a critical role in the performance of project teams, as project managers are expected to create and accomplish positive outcomes for their projects. So, IS project team managers should be able to lead their teams effectively, i.e., make their teams achieve high performance.

Thamhain (2004) examined several factors (e.g., leadership, communication, trust, expertise, and cooperation) that may influence the performance of technology-based project teams embedded in organizations, whether they are multidisciplinary or designed for specific tasks. Such factors may help team leaders to identify (1) issues that result from putting together different personalities or (2) best practic-

es to overcome unforeseen difficulties, which can benefit project teams. For instance, the ability of managers to coordinate their teams has a major influence on teams' performance, as managers play a decisive role when it comes to accomplishing positive results by teams during the execution of a project. The findings of this comprehensive work (that continues to summarizing more recent and relevant literature on those factors, e.g., Weimar et al., 2013; Salas et al., 2008; Mealiea and Baltazar, 2005), led the author to suggest some recommendations for leading project teams effectively, such as, staff and organize the project team, build an high-performance image for the team, build and maintain team member commitment, and manage conflict and problems. Build and maintain team member commitment (to project plans, goals and results), for instance, is found to be a reliable predictor to project team performance (Collins and Schragle-Law, 2010; Thamhain, 2004).

Even though high-performing teams have been studied for some years, little has been written about leading teams to high performance in the domain of IS projects. Building upon Thamhain's (2004) recommendations for leading teams effectively, the primary aim of this pilot study is to investigate how these recommendations are perceived and put to practice by IS students in their projects. 28 teams of master's students involved in the development of IS projects were invited and participated in the study. As this is a work-in-progress, we present preliminary results based on quantitative statistical analysis.

The remainder of the paper is organized as follows. Next section briefly reviews and discusses related work on project teams and team performance. Then, method and cohort characteristics are presented. Next, results are reported and discussed. The final section summarizes and introduces future work.

2 Teams and Team performance

Several authors (e.g., Weimar et al., 2013; Salas et al., 2008; Kozlowski and Ilgen, 2006; Bragg, 1999; Katzenbach and Smith, 1993) agree on a team being: (1) a group of two or more persons who (2) socially interact (face-to-face, virtually, or both ways); (3) are committed to general purposes and common goals to reach those purposes; (4) are brought together to perform organizationally relevant tasks (or projects); (5) exhibit interdependencies with respect to goals, workflow, and outcomes; (6) have complementary skills and different roles and responsibilities; and (7) are together embedded in an encompassing organizational system, with boundaries and linkages to the broader system context and task environment. A team is also characterized by its own (1) direction and momentum (e.g., pulling together in the same direction to achieve something); (2) common approach (e.g., particular organizational and motivation methods); and (3) mutual accountability (e.g., with each team member being accountable for her/his actions, as these add to the team as a whole) (Moura et al., 2014).

While working on a project, each team member engages in both individual and team work because teams must integrate, synthesize, and share information; and they also need to coordinate and cooperate. Individual work refers to the components of a team member's activity that do not require interdependent interactions with other members of the team (e.g., each team member plays a specific role). Teamwork, on the other hand, refers to the interdependent components of team activity required to effectively coordinate the performance of multiple individuals. Teamwork is also conceptualized as the set of interrelated cognitions, attitudes, and behaviors that contributes to the dynamic processes of team performance (Salas et al., 2008).

Team performance can be defined as the multilevel process that comes up as team members engage in managing both their individual and team levels of work and teamwork processes. Plus, team performance can be evaluated in terms of effectiveness. Effectiveness assesses the degree to which a team meets the expectations of quality for the outcomes of team performance processes (Weimar et al., 2013; Salas et al., 2008).

Literature (e.g., Hakanen et al., 2012; Ross, 2008; Bragg, 1999; Katzenbach and Smith, 1993) suggests that high-performing teams: (1) have a supporting and encouraging leadership; (2) possess the right mix of technical and functional expertise and problem-solving, decision-making, and interpersonal

skills; (3) shape their purposes usually in response to the firms' high management; (4) invest a huge amount of time and effort exploring, shaping, and agreeing on a purpose that belongs to them both individually and collectively; (5) translate their purposes into explicit, measurable, and attainable performance goals, with purposes and goals building on one another and being combined with team commitment; (6) develop strong commitment to how they will work together to accomplish their purposes; and (7) hold themselves responsible, both as individuals and as a team, for the team's performance. Thus, a high-performing team is an ideal one (with 25 members, tops) that combines individual talents and abilities into a high performing whole with capabilities that exceed those of its most talented member (Ross, 2008).

Supporting and encouraging leadership characterizes high-performing teams. In fact, team leadership plays a critical role in the performance of project teams (Leonard and van Zyl, 2014; Stagnaro and Piotrowski, 2014; Collins and Schragle-Law, 2010; Thamhain, 2004). For instance, Thamhain (2004) suggested a set of recommendations to help team leadership (e.g., project leaders and their managers): (1) to have a better understanding of the criteria and organizational dynamics that can drive project team performance; and (2) to provide some broad guidelines and benchmarks for leading project teams effectively. We believe that these recommendations for team leaders explain (to a good extent) the support and encouragement that characterizes the leadership of teams that perform at their best.

Higher education institutions are receiving steady pressure to better prepare students for project management positions. As a result, the value being placed on project management courses is increasing in higher education, especially in the domain of IS (Tabatabaei et al., 2009). As little has been written about leading teams to high performance in the domain of IS projects, we decided to conduct this pilot study in an academic setting using Thamhain's (2004) recommendations for leading teams effectively as foundation. Our work-in-progress primary aim is to provide an answer to the following research question: how do IS students' perceptions on recommendations for leading teams to high performance compare with their project management practice.

3 Method

Our method involved a survey, with the data analyzed using descriptive statistics and reliability estimates. We gathered IS team members' perceptions on the importance and implementation of each of Thamhain's (2004) recommendations in their teams using a 7-point Likert scale, with 1 indicating total disagreement and 7 indicating total agreement. Note that, in the process of adapting Thamhain's (2004) recommendations, we have split the second recommendation ("define work process, interfaces, and team structure"), into three, so that its meaning could be better understood by our population (for the full set of recommendations please refer to Thamhain, 2004, p. 541-543).

We collected data from a structured survey that was given to self-selected teams of Portuguese master's students. Each team was enrolled in one of the following three one-semester courses – "Technologies and Information Systems Project", "Information Systems Development", and "Information Systems Project Management". By collecting data from different courses, we aimed to minimize the bias caused by possible characteristics specific to a particular course. These courses are part of integrated master's in information systems engineering and management and master's in information systems programs. Each team was involved in the development of a semester-long IS project (as these are meant to prepare students for the work context in IS). Team leaders (one per team) were chosen among team members.

Between June and July of 2014, we administered the survey to 131 team members of IS projects. Although our study used items identical to those of Thamhain's (2004) (thus taking advantage of previous validation), prior to administering the survey we conducted a focused group study of five team members to assess the face validity of the survey. The results indicated a few minor refinements (i.e., small adjustments to the translation of Thamhain's (2004) recommendations to Portuguese language), such as, rephrasing one of the survey's questions to improve readability. These refinements did not affect

construct validity. After validating the survey, we contacted the project managers of 28 projects, inviting their team to participate in the survey. Each participating project team had between three to six team members. The participants, to whom we promised complete confidentiality, were asked to fill out the surveys and return them to us on site.

We received surveys from 118 participants. Three of the surveys were unusable due to incomplete responses, so 115 surveys were used in our analysis, yielding a final response rate of 87.8%. Of the respondents, 15.7% were female; 35.7% were student workers; the majority (55%) was between 23 and 30 years old. On the basis of the responses received the projects described were classified into four types: custom development (32.1%); information systems analysis (25%); consulting (25%); other, including business intelligence, workflow, etc. (17.9%). Even though the projects have been developed in an academic setting, it is important to note that they share the same characteristics of professional projects, being the project success indexed to the benefits obtained by the project customers (entities internal or external to the university where the projects were developed). The average duration of the projects was three months. In nine of the 28 project teams (32.1%) occurred at least one "crisis" situation (due, for instance, to one team member leaving the team prematurely or by internal conflicts). The big majority of teams had at least two students who had worked together previously.

4 Results and Discussion

Cronbach's Alpha was computed to test the reliability and internal consistency of the responses regarding the recommendations. Cronbach's Alpha is higher than 0.8 (14 items), which is considered excellent (Cohen, 1988), indicating a high degree of internal consistency in the responses.

Figure 1 shows participants' perceptions on the importance of recommendations for leading teams to high performance. Results show that our population conferred great relevance to all Thamhain's (2004) recommendations for leading teams effectively. That is, points per recommendation are 5.97 on average. Overall, the most relevant features were "Manage conflict and problems", "Define work process", "Define team structure", and "Provide proper direction and leadership", whereas the least relevant ones were "Create proper reward systems", "Build an image of high performance", "Ensure senior management support", and "Conduct team building sessions".

Figure 2 shows participants' perceptions on the implementation of recommendations for leading teams to high performance, regarding to what was done in their teams. Results show that, on average, what is considered important is really being put to practice. However, on average, points per recommendation as to implementation (5.68) are slightly lower than points per recommendation as to importance (5.97).

The perceptions on both importance and practical implementation of recommendations are very similar in the cases of "Define team structure", "Define interfaces", "Involve team in project planning", "Ensure senior management support", "Staff and organize the project team", and "Build an image of high performance", with averages numerically diverging only about 0.2 points or less.

To assess whether *perceptions on importance* and *practice* mean ranks differ, we used the non-parametric Wilcoxon signed-rank test for paired samples. Numerical and statistically significant differences were found in the cases of "Define work process" ($p<0.01$), "Stimulate enthusiasm, excitement and professional interests" ($p<0.01$), "Create proper reward systems" ($p<0.01$), "Build and maintain commitment" ($p<0.05$), "Manage conflict and problems" ($p<0.01$), "Conduct team building sessions" ($p<0.01$), and "Provide proper direction and leadership" ($p<0.01$).

Major differences among averages (of more than 0.5 points) occurred in the cases of "Create proper reward systems", "Stimulate enthusiasm, excitement and professional interests", and "Conduct team building sessions".

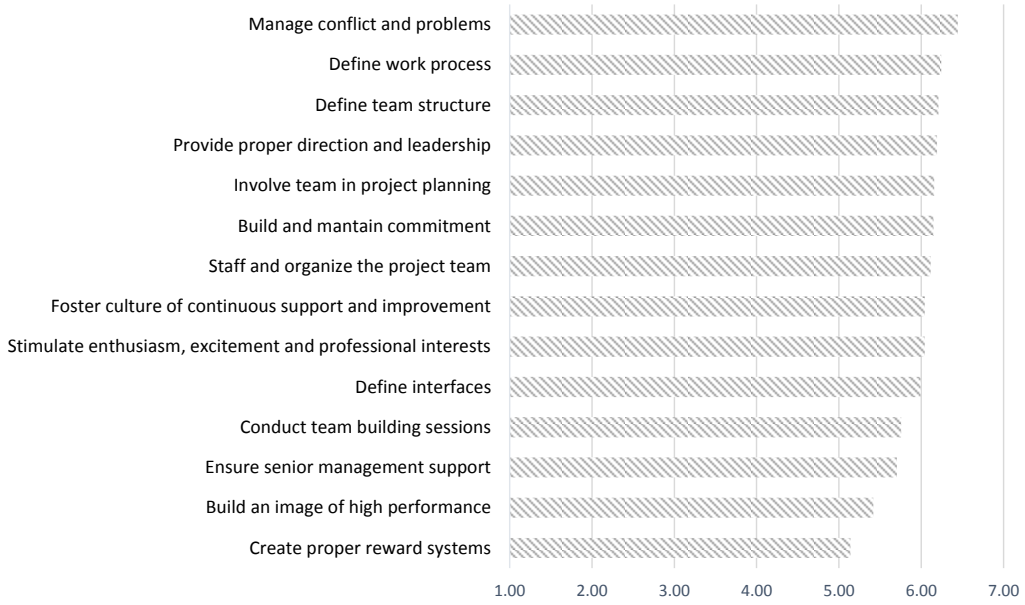

Figure 1. Recommendations for leading teams effectively: perceptions on importance.

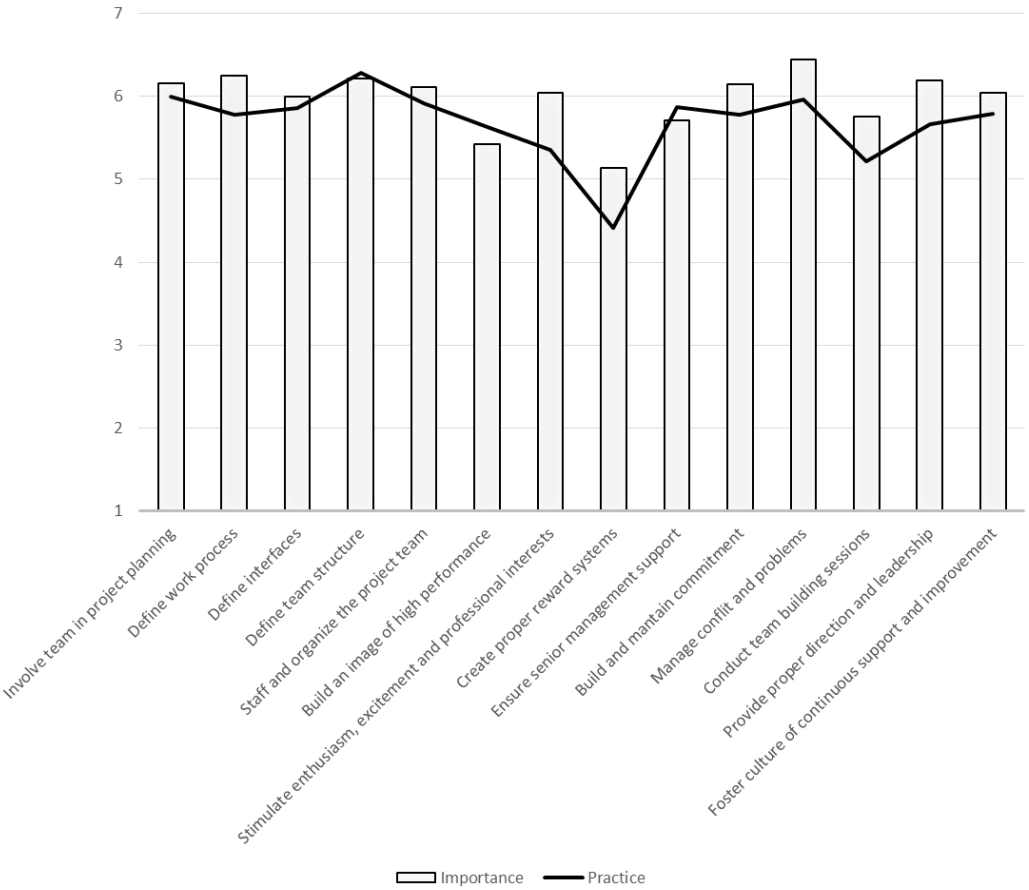

Figure 2. Recommendations for leading teams effectively: perceptions on importance vs. practice.

In the cases of "Create proper reward systems" and "Conduct team building sessions", the difference is somewhat expected, since they were both given lower importance by students. Concerning "Create proper reward systems", as this work-in-progress was developed in an academic setting, students may not expect other kinds of rewards besides their final grade. However, in an organizational setting, team leaders can improve team performance by rewarding, for instance, team members who demonstrate high levels of responsibility and group morale (Stagnaro and Piotrowski, 2014; Sun et al., 2014; Mealiea and Baltazar, 2005). Regarding "Conduct team building sessions", since most teams had at least two students who had worked together previously (i.e., they knew each other fairly well), students probably did not feel the need to conduct organized team building efforts to unite the workgroup. In the case of "Stimulate enthusiasm, excitement and professional interests", may indicate that team leaders were not well prepared to motivate and transform their team members through leaders' sensitivity to individual members' needs and feelings (Sun et al., 2014; Thamhain, 2004). Instructors should be aware of these aspects so they can improve (by, e.g., providing tips and guidance on effective team leadership) future implementations of these sorts of courses.

Regarding most recommendations, perceptions on importance are higher than perceptions on practical implementation, but for "Define team structure", "Build an image of high performance", and "Ensure senior management support". Concerning "Define team structure", as students were fairly used to work together, they were probably also used to properly define tasks and accountabilities per team member (although they did not give too much importance to it). The high-performance image of the teams perceived by their members is argued (1) to stimulate the members' pride of participation and ownership and build confidence and desire to reach out and think creatively; and (2) to be an opportunity for team members to demonstrate their individual value (Collins & Schragle-Law, 2010, Thamhain, 2004). This might have been practiced by our cohort to compensate for the enthusiasm, excitement, and personal interests that were not properly stimulated by team leaders. Regarding "Ensure senior management support", despite not being given too much relevance by students, they acknowledged that course instructors (who played the role of senior managers) did a good job (1) negotiating the required resources with project customers (entities internal or external to the university); (2) obtaining resource commitment; and (3) dealing with political obstacles (Thamhain 2004; Katzenbach and Smith, 1993).

5 Conclusion

Firms should be able to rely on high-performing teams (e.g., effective teams that gather knowledgeable and skilful professionals) (Moura et al., 2014). Higher education institutions are receiving steady pressure to better prepare students for project management positions. Therefore, the value being placed on project management courses is increasing in higher education, especially in the domain of IS (Tabatabaei et al., 2009).

Hopefully, we expect that this pilot study helps to improve the understanding of leading practices and processes concerning high-performing teams, so students (future project team members and managers) can achieve better results in today's demanding business environment. Reported results suggest that most of Thamhain's (2004) recommendations were empirically supported in the student related academic environment, so they can be regarded as aspects conducive to high team performance in the domain of IS projects in higher education.

Before discussing directions for future research, it is appropriate to point out that the main limitation of this pilot study is that findings are based on a limited number of participants from one university. Therefore, more empirical data needs to be collected to test the generalization of those recommendations in this and other fields. In spite of this limitation, we believe that the work-in-progress reported here represents a substantive advance on earlier exploratory work. Future work will aim to figure out the impact of implementing each recommendation on team performance.

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